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SPECIFICATION

FOR

ELECTRIC PASSENGER ELEVATORS

OF

TWO LABORATORY BUILDINGS

FOR THE

UNITED STATES DEPARTMENT OF AGRICULTURE,

WASHINGTON, D. C.

JAMES WILSON, Secretary of Agriculture.

BUILDING COMMITTEE.

B. T. GALLOWAY, Chairman.

A. C. TRUE.

GIFFORD PINCHOT.

RANKIN, KELLOGG & CRANE, Architects.

JOHN STEPHEN SEWELL, Supervising Engineer.

R. BARNARD TALCOTT, S. FRANKLIN GARDNER,
Mechanical Engineers.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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ADVERTISEMENT.

OFFICE OF THE BUILDING COMMITTEE,
U. S. DEPARTMENT OF AGRICULTURE,
Washington, D. C., December 8, 1905.

Sealed proposals will be received at this office until 2 o'clock p. m. on the 5th day of January, 1906, and then opened, for the installation of electric passenger elevators of two laboratory buildings for the United States Department of Agriculture, Washington, D. C., in accordance with the drawings and specifications, copies of which may be obtained at the Office of the Building Committee, United States Department of Agriculture.

All applications must be accompanied by a certified check for \$50, made payable to the Disbursing Clerk of the Department of Agriculture, which checks will be retained until the return of the drawings and specifications.

B. T. GALLOWAY,
Chairman.

(2)

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SPECIFICATION

FOR

Electric Passenger Elevators of Two Laboratory Buildings for the
United States Department of Agriculture, Washington, D. C.

GENERAL CONDITIONS.

Form of Proposal and Signature.

1. Proposal must be made on the blank form hereto attached, plainly marked "Proposal for Electric Passenger Elevators," on the envelope or cover, with the title of buildings, as given above, and addressed to the Chairman of the Building Committee, Department of Agriculture, Washington, D. C., stating in writing and figures (without interlineation, alteration, or erasure) the sum of money for which the bidder proposes to supply the materials and perform the work required by the drawings and specifications, the separate prices called for in proposal sheet, and also prices for certain portions of the work. The proposal must be signed with the full name and address of the bidder; if a copartnership, the copartnership name by a member of the firm, with names and addresses in full of each member; and if a corporation, by an officer in the corporate name, with the corporate seal attached to each signature. No telegraphic proposals or telegraphic modifications of proposals will be considered. Proposals received after the time advertised for the opening will be returned unopened. If proposal is sent by registered mail, allowance should be made for the additional time required for such transmission.

Certified Check.

2. Each bidder must submit with his proposal a certified check, in amount \$1,000, drawn to the order of the Disbursing Clerk of the Department of Agriculture, and the proceeds of the said check shall become the property of the United States if for any reason whatever the bidder, after the opening of the bids, withdraws from the competition or refuses to execute the contract and bond required, in the event of such contract being awarded to him. Checks submitted by the unsuccessful bidders will be returned after the approval of the contract and bond executed by the successful bidder.

Eight-hour Law.

3. The attention of the bidders is called to the Act of Congress, approved August 1, 1892, limiting the hours of daily service of laborers and mechanics employed upon public works of the United States to eight hours in any one calendar day.

Convict Labor.

4. In compliance with Executive order dated May 18, 1905, convict labor can not be employed in connection with this contract.

Subcontractors.

5. No subcontractor or other person furnishing material or labor will be recognized, nor will the United States be responsible in any way for the claims of such persons beyond taking a bond, with good and sufficient sureties, with the additional obligation that the general contractor shall make prompt payment to all persons furnishing him labor or material used in the prosecution of the work. Persons so furnishing materials or labor to have a right of action on said bond, in the name of the United States for their use.

Designation of Parties.

6. The contracting officer, on the part of the United States, is the Secretary of Agriculture; the officer appointed by him to supervise the construction of the building is designated in this specification as "Supervising Engineer." The present incumbent of this office is Capt. John Stephen Sewell, Corps of Engineers, U. S. Army.

7. The engineers appointed by the Secretary of Agriculture for the designing and superintending of the mechanical equipment of the buildings are R. Barnard Talett, consulting mechanical engineer, and S. Franklin Gardner, mechanical engineer and superintendent.

8. All matters pertaining to the installation of the mechanical work are to be handled by the mechanical engineer and superintendent, acting in consultation with the consulting mechanical engineer. All matters, however, involving the structural work of the buildings, modifications in contract, and payments thereon must be approved by the supervising engineer.

9. Wherever the word "bidder" is used herein, it shall be held to mean any individual or firm of individuals, or any member of any firm or any corporation signing a bid submitted.

10. Wherever the word "contractor" is used herein it shall be held to mean any individual or firm of individuals, or any corporation, who may contract with the United States to do the work or furnish materials under this specification.

Routine of Business.

11. After the award and signing of the contract, all business relating to the work shall be transacted through the office of the

mechanical engineer and superintendent, except as otherwise herein provided.

Rights Reserved.

12. The materials proposed to be used, time for completion of the work, and the competency and responsibility of bidders will receive consideration before award of contract.

13. The Department reserves the right to accept any part or parts of the proposal made at the prices included in same; also to waive any informalities in, and to reject any and all proposals.

Form of Contract.

14. The contract which the bidder agrees to enter into shall be in form based upon the terms of this specification.

Bond.

15. The successful bidder must furnish a bond in a sum equal to 50 per cent of the amount of the contract, with sureties satisfactory to the Department, guaranteeing the fulfillment of all provisions of the contract, the satisfactory completion of the work included therein, within the stipulated time, the prompt payment of all persons furnishing materials or labor required in the execution of the work, and covering all guarantees herein provided for.

16. No payment will be made on this contract until the bond has been submitted to the Department and approved by the Secretary of Agriculture.

17. The contractor must obtain, at his expense, all necessary policies of insurance on work and materials supplied by him, as the same will be at his risk until final completion, inspection, and acceptance; but the contractor will be relieved of any risk for such portions of the buildings as may be occupied by the United States before the entire completion of his contract.

Modifications.

18. The Department reserves the right to make any additions to, omissions from, or changes in the work or materials called for by the drawings and specifications, without notice to the surety or sureties on the bond given to secure satisfactory compliance with the terms of the contract; and the United States further reserves the right to demand additional security when additions are made, if in the judgment of the supervising engineer such security is required. For such additions, omissions, or changes, the contractor must submit a reasonable proposal. If the proposals submitted are deemed unreasonable by the supervising engineer, he shall, acting for the United States, have the right to fix the value of such additions, omissions, or changes, and no claim for damages on account of such changes or for anticipated profits shall be allowed.

Delays.

19. Each bidder must submit his proposal with the distinct understanding that in case of its acceptance, time for the completion of the work shall be considered as the essence of the contract, and that for the cost of all extra inspection, salaries, and other expenses entailed upon the United States by delay in completing the contract, the United States shall be entitled to a fixed sum of \$25 as liquidated damages, computed, estimated, and agreed upon, for each and every day's delay not caused by the United States: *Provided*, That the collection of said sum may, in the discretion of the Secretary of Agriculture, be waived in whole or in part, and that the contractor shall be entitled to one day, in addition to said stipulated time, for each day's delay that may be caused by the United States, or may be due to causes which could not have been foreseen or prevented by the contractor.

20. The supervising engineer, acting for the United States, reserves the right to suspend any portion of the work embraced in the contract whenever, in his opinion, it would be inexpedient to carry on said work.

Notice to Sureties.

21. The final inspection and acceptance of the work shown by the drawings and specifications, forming a part of the contract, shall not be binding or conclusive upon the United States if it shall subsequently appear that the contractor has willfully or fraudulently, or through collusion with a representative or official of the United States on the work, supplied inferior material or workmanship, or has departed from the terms of his contract. In any such case the United States shall have the right, notwithstanding such final acceptance and payment, to cause the work to be properly performed and satisfactory material supplied to such extent as in the opinion of the mechanical engineers may be necessary to finish the work in accordance with the drawings and specifications therefor at the cost and expense of the contractor and the sureties on his bond, and shall have the right to recover against the contractor and his sureties the cost of such work, together with such other damages as the United States may suffer because of the default of the contractor in the premises, the same as though such acceptance and final payment had not been made.

Supervision.

22. Every part of the work is to be executed under the direction and to the entire satisfaction of the mechanical engineers, and subject to the final approval and acceptance of the supervising engineer.

Measurements.

23. Bidders should visit the buildings in order to get a satisfactory comprehension of the work required and make such measurements as they may desire, as the drawings accompanying this specification are not intended to be scaled.

Time to Complete.

24. The contract time for the completion of the two laboratory buildings is June 14, 1907, and the work on these buildings under this contract must be begun as soon, and prosecuted as fast, as the condition of the buildings will permit, under the direction of the mechanical engineers, and at such times as to avoid interference with other contracts, and must be completed by the above date.

Patents.

25. The Department will not recognize any demand brought on account of infringement of patents; but will hold the contractor and his bondsmen strictly responsible for any delay or cost resulting from his failure to fully protect the United States against patent rights.

Tools and Appliances.

26. All tools and appliances required for the proper execution of the work must be provided by the contractor and be maintained, used, stored, and moved at his expense and risk.

Lighting.

27. The contractor must furnish and maintain all artificial lights necessary for the proper execution of the work.

Cutting, Restoration, and Removal of Débris.

28. The contractor shall at his expense do all necessary cutting, drilling, etc., repair in the best possible manner, under the direction of the supervising engineer, any damage to his own or others' work and materials incident to his contract, and remove from the premises all débris resulting from the execution of his contract.

Inspection and Acceptance of Work.

29. Any materials delivered or work performed by the contractor, at any and all times during the progress of the work and prior to its final acceptance and the payment therefor, shall be subject to the inspection of the mechanical engineers, who shall reject any part that in their opinion is not strictly in accordance with the contract.

Personal Interview.

30. The right is reserved to require the contractor or his authorized representative to visit the Department, without expense to the

United States, if at any time it is considered that, in the interest of the United States, a conference is necessary for the prompt adjustment of any complicated or unsatisfactory conditions that have developed in connection with this contract. Any understanding arrived at as a result of such conference shall not be binding until formally approved.

Interpretation of the Specification.

31. In all questions relating to the interpretation of this specification or any part thereof the decision of the mechanical engineers, concurred in by the supervising engineer, shall be final.

Foreman, etc.

32. The work shall at all times be conducted in charge of a competent superintendent or foreman, who shall represent the contractor and have general authority to act for him, and the contractor shall discharge and not employ upon this work any foreman, or any and all workmen, whom the supervising engineer may deem incompetent or careless. The contractor shall also give his personal attention to the work.

Materials and Workmanship.

33. All materials and appliances used under this contract, unless specifically described, shall be of best grade of standard manufacture, and all workmanship shall be strictly first-class.

Notification of Readiness for Inspection and Tests.

34. Upon the completion of all the work under this contract the contractor shall give formal notice to the mechanical engineers of his readiness for the inspection and tests.

Tests.

35. Upon the completion of the entire work, and also, if deemed advisable, at the end of the three months' operating test, the mechanical engineers will cause to be made such tests of the elevators as may be considered necessary to determine their compliance with the terms of the contract; these tests to be made by the contractor at his own expense, under the direction of the mechanical engineers. If these tests show that the work is in any way defective, at variance with the specification requirements, or dangerous or objectionable in operation, the contractor must immediately make all changes necessary to correct the same and remedy all defects to the satisfaction of the mechanical engineers, making additional tests if required by the engineers.

36. During the tests the contractor will also be required to provide, at his own expense, a competent man to instruct the employees of the Government in the care and operation of the elevators.

Guarantee.

37. The execution of the formal contract and bond shall be a guarantee to keep the entire apparatus and each and every part thereof in perfect condition, usual wear and tear excepted, for a period of three months from the date of the conditional acceptance of the work, and to remedy, without expense to the Government, all defects, whether in materials, workmanship, or operation, that may become apparent during that period.

Failure of Contractor to Remedy Defects.

38. In the event that the contractor does not remedy the defects which are apparent at the beginning and at the end of the three months' operating test or which may develop during the test, or does not make such changes as may be demanded by the mechanical engineers to complete his contract in what the mechanical engineers consider a reasonable time, the right is reserved to have defects remedied or changes made and to charge the cost thereof against the account of the contractor.

Payment.

39. Payment will be made at the expiration of the satisfactory three months' operating test required under the above guarantee.

GENERAL DESCRIPTION.

Scope of Work.

40. This specification is to cover the installation of six electric passenger elevators, three in each of the two laboratory buildings. The contractor is to include all appliances and improvements necessary to make the installation comply with the latest and best practice.

Drawings.

41. The drawings, Nos. E. 151 and E. 152, show the general arrangement of the buildings, the location of the elevator shafts, and sections through the shafts. The dimensions given on drawings of shafts, etc., are taken from the general-construction drawings, and the Department assumes no responsibility for the exact dimensions of work in place. The successful bidder must visit the building and make, and be responsible for, his own measurements.

42. The successful bidder will be required to submit to the mechanical engineers for approval, detail drawings in triplicate of the complete layout of the elevators, showing location of machines, guides, and counterweights, and also the design of cars. These drawings must be submitted as soon as possible after approval of the bond, and must be approved by the mechanical engineers before the execution of any of the work.

Work in Place.

43. The shafts, grille work at entrances to shafts, the elevator-entrance doors, and the 8-inch **I** beams across double elevator shafts, located approximately at each floor line (except at basement-floor line, where an **I** beam is not provided), are to be installed under another contract. The walls of shafts are of brick, finished inside with enamel brick.

Travel.

44. All cars are to run from basement floor to fourth floor, a distance of 60 feet.

MACHINES.

Character.

45. Only machines of standard character and generally recognized merit, manufactured by concerns of large experience, will be considered.

Location.

46. All elevator machines are to be located and securely bolted to platforms at top of shafts.

Type.

47. Machines must be of the tandem worm-gear type, with motor and drum mounted on the same base. Drums to be driven through right and left worms cut on solid steel shaft, meshing with two interlocking bronze wormwheels. These gears are to run in oil in a dust-proof gear case, and must run smoothly and in perfect alignment. Special attention is called to the fact that the worm threads must be cut from a solid part of the worm shafts and are not to be separate and keyed or pinned on.

Drums and Sheaves.

48. Drums to be of cast iron of as large diameter as location of the machine will permit and turned and grooved for cables, the grooves to be of such length as to accommodate at least one additional turn each of hoisting and drum counterweight cables beyond the length required for car travel.

49. Counterweight sheaves of cast iron are to be provided, grooved for car counterweight cables, and to be properly supported at top of shafts.

Lifting Capacity and Speed.

50. Each elevator must have a capacity to lift a live load of 2,250 pounds, exclusive of weight of car and cables, at a speed of 275 feet per minute.

51. A practically constant car speed must be maintained under all conditions of load up or down, and the maximum allowable speed variation will be 10 per cent.

MOTORS.

Type of Motors.

52. Motors are to be compound-wound, for 220 volts, direct current. They are to be of design adapted to elevator service and must be capable of developing the required power and of withstanding temporary overloads of at least 50 per cent and shocks occasioned by frequent starting under heavy loads.

Field Coils.

53. Field coils to be form-wound and so secured that they may be readily removed without unwinding.

Armatures.

54. Armatures to have slotted core with windings thoroughly insulated and secured firmly in place. They are to be balanced both mechanically and electrically and to be well ventilated and easily removable.

Commutators.

55. Commutators to be of drop-forged or hard-drawn copper of highest conductivity, insulated with mica of even thickness, and must run free from sparking or flashing at the brushes at any load or during change in load.

56. Commutators to have ample bearing surface and radial depth for wear.

Brushes.

57. Brushes to be of carbon of such cross-sectional area that the current density at full load shall not exceed 35 amperes per square inch.

Brush Holders.

58. Brush holders to be of such design that no clattering will result from continuous use. Tension to be readily adjustable and brush position adjusted by means of rocker.

Insulation.

59. The frames of the machines must have an insulation resistance from the field coils, armature windings, and brushes of not less than 1 megohm. Motors must be capable of standing a breakdown test of 1,500 volts, alternating current, for one minute.

Heating Effect.

60. Motors must be capable of carrying full rated load, as specified, for a period of two hours' continuous run, and at the expiration

of that time the rise in temperature of the armature and fields shall not exceed 85° F. and that of the commutator 90° F. above the temperature of the surrounding atmosphere. Temperatures to be measured by thermometers shielded by cotton waste in a manner approved by Department's representative.

Efficiencies.

61. Bidders are required to state in their proposal the rated horsepower output of motor and guaranteed efficiencies when delivering one-quarter, one-half, three-quarters, and full-load horsepower output.

Shop Tests.

62. The motor guaranteed efficiencies, heating effect, and insulation resistance shall be determined by actual tests in the presence of the Department's authorized agent, who shall determine the test conditions.

63. The tests are to be made at the shop where the motor is constructed, to begin within ten days after receipt of notice from the contractors of their readiness to commence tests, and are to be at the expense of the contractors, except traveling and other necessary expenses of the Department's agent.

64. The mechanical engineers reserve the right to waive these tests or any portion of them, it being understood that those portions not waived shall be exacted when the apparatus is installed, if not performed at the shops, as specified above.

CONTROLLING EQUIPMENT.

Type of Control.

65. Each elevator must be equipped with a full magnetic control, consisting of an operating switch in car, electrically connected by a rubber-insulated and braided flexible cable conductor with controller magnets which make the various motor and rheostat connections governing acceleration, speed, and direction of movement. No intermediate mechanical devices to perform any or part of any of the above functions will be permitted.

Car Switches.

66. Car-controlling switches are to be inclosed in ornamental metal cases, located in cars as approved by the mechanical engineers.

Controllers.

67. All contact pieces must have ample metal for stiffness and contact surfaces, and must be so designed that a good bearing is obtained at every point and not more than 100 amperes carried per square inch of bearing surface at maximum load.

68. Each controller must accomplish the following functions:

- (a) Make and break circuit and reverse motor, under control of operator, without destructive arcing.
- (b) Give easy acceleration of car speed independently of operator, the car starting or stopping without shock or jar.
- (c) Lift main brake, cut out starting resistance and series field by successive steps in starting.
- (d) Apply brake, cut in resistance, etc., in series with armature in stopping, in order to obtain a dynamic breaking action of appreciable strength.

Controlling Panels.

69. A controlling panel for each elevator is to be erected near machines as directed, constructed of blue Vermont marble, $1\frac{1}{2}$ inches thick, highly polished and with beveled edges, bolted to a heavy angle-iron frame securely fastened in position.

70. On the face of the controlling panels, in addition to the necessary electro-magnetic switches there shall be mounted one D. P. circuit-breaker and one D. P., S. B. knife switch of ample capacity; the resistance devices, bus bars, and bolt connections are to be mounted on the rear of the panels.

71. All metal parts of the mountings on face of panels shall be finished copper, polished and well lacquered.

72. Suitable lugs and terminal blocks to be used throughout the installation.

73. Connections to controlling tablets are to be run from junction boxes located in attic adjacent to location for machines; the connections from switchboard to these junction boxes are to be installed under another contract.

74. All cables, including connections from controlling tablets to motors, to be rubber-insulated cables having braided coverings, and of such size that the maximum current carried shall not exceed the limits prescribed by the latest National Electrical Code, and the insulation resistance between conductors and between conductors and ground shall be at least 1 megohm.

75. All wires are to be run in steel conduit except such connections between controllers and motors as may be so short as to be self-supporting, and these must be fully protected from abrasion or other mechanical injury.

SAFETY DEVICES.

Types.

76. Each elevator must be supplied with all devices necessary for safe operation, including the following or their equivalent, which must act in conjunction with the main brake: Upper and lower limit stops, centrifugal governor, automatic controller stop, slack cable device, and tee guide grips.

Brake.

77. A spring-actuated magnetic brake is to be provided on worm shaft of sufficient power to stop and hold the elevator under maximum load.

78. Brake must be made instantly operative when released by magnet, the circuit of which must be opened by the several safety devices so as to apply brake at both limits of travel, when car attains excessive speed, when operator releases car-controller lever or brings it to stop position, when car is checked in shaft while descending, and on failure of current.

Upper and Lower Limit Stops.

79. Elevators must be provided with upper and lower limit stops, which must promptly cut off motor current when car travel is exceeded in either direction. In addition to the limit stops on drum shafts, limit switches shall be provided in hatchways, which will open controller circuit and stop motor when travel of car is exceeded in either direction.

Centrifugal Governor.

80. Each elevator must be provided with a centrifugal governor which must cut off motor current at determined maximum speed. If this governor is also used to operate guide grips it must perform both operations independently. the motor current to be cut off before the speed at which the guide grips operate has been attained.

Automatic Controller Stops.

81. An automatic controller stop is to be provided for each elevator, which must bring car lever to central position and car at rest if for any reason the operator's hand is removed from the controller lever.

Slack Cable Device.

82. A safety appliance must be provided on each elevator for cutting off current, if for any reason the car is suddenly checked in

shaft while descending or upon the breaking of one or both of the hoisting or back drum cables.

Potential Switch.

83. A potential switch or circuit-breaker must be provided for each machine at supply main, which will open the circuit on failure of current or excessive drop in voltage.

Guide Grips.

84. Safety tee guide grips of approved pattern must be provided at each elevator, which become operative whenever the maximum speed limit is exceeded in descending.

85. Grips must be operated by a rope, passing through a clamping device controlled by a centrifugal governor at top of shaft and around a drum under cage, which is to revolve when rope is clamped and operate guide grips by means of a screw. The device must be arranged so that excessive car speed will cause the jaws of the device to first grip the guides with sufficient pressure to check but not to stop the car, and the further travel of the car will increase the pressure on the guides until the car is brought to an easy stop.

86. The guide grips shall be tested by dropping the car free with a net load on the platform equal to two-thirds the load specified.

87. Tests are to be made before connecting cables and before cars are attached to cages, and must be performed in the presence of a Department representative at the building, who shall certify as to test conditions, distance traveled by car during fall, and distance after grips have operated before car is stopped. The distance in each case and the total distance of drop that is acceptable will be determined by the representative of the Department.

Additional and Alternate Safety Devices.

88. Bidders are requested to state on proposal sheet the name of manufacturer or trade name of a safety device which may be placed in addition to the regular guide-grip safety devices specified. This safety device must be entirely independent of the regular guide-grip safety and shall not be dependent upon gripping the guide rails in order to bring the car to an easy and gradual stop in event of excessive speed due to the breaking of cables or other cause.

89. This additional safety device must also prevent the car exceeding its travel either up or down beyond the points regularly controlled by the automatic limit stops specified heretofore.

90. The successful bidder will be required to submit in triplicate a complete description, with drawings, of such proposed safety device, and reference must be made to at least two buildings where such safety device may be seen in operation.

91. Each bidder is also requested to state the amount he will add to, or deduct from, his lump-sum proposal if the regular guide-grip safety specified is omitted and the above-described device is installed in lieu thereof. The safety device must be acceptable to the mechanical engineers as a satisfactory and complete substitute for the regular guide-grip safety.

92. The right is reserved to accept or reject the above-described safety device at the price named by bidders on the proposal sheet.



CARS.

Size, etc.

93. The car platforms are to be as large as the shafts will permit, approximately 5 feet 6 inches by 6 feet; the clear height in the cars to be not less than 8 feet 6 inches.

94. Cars are to be in every way subject to the approval of the mechanical engineers.

Framing.

95. The platforms and car framing for all elevators must be substantially constructed of extra-heavy steel framing, bolted and riveted, and fitted with guide shoes of an approved design.

Cages.

96. The cages for the elevators to be constructed of wrought iron or steel, the lower parts and roof of ornamental panelwork and the upper part of ornamental openwork; the tops of cages to be arranged so as to be removable.

97. All the materials used in the construction of the cages must be of the best quality, the grille work to be designed to correspond with the design of the inclosure, and to be electro-bronzed to match finish of same.

98. A detail sketch of the grille work is given on drawing No. E. 151, but detail shop drawings of cages must be furnished and approved before cars are constructed.

99. All entrance openings in cars must be properly trimmed and be approximately 2 feet 6 inches wide. Provision, however, must be made in cars Nos. A-2 and B-2 for 5-foot-wide openings, the portions of the cages behind the central panels of the grille work at entrances to the shafts to be hinged so that same can be swung back into the cars. These movable sections of the cages are to match in every respect the other sections of the cages and are to be supported on heavy pattern hinges, to be provided with bolts at top and bottom of front ends for fastening same to cars, and also with a catch for securing same in place when swung back into cars.

Floors.

100. The floors of cars to consist of 1½-inch tongued and grooved maple flooring, best quality, smoothly finished all over, and covered with interlocking rubber tiling, $\frac{3}{8}$ inch thick, cemented on top of wood floor. A brass strip, $\frac{3}{8}$ inch thick, is to be provided along doorway of each car, making a finish and joint between tiling and edge of car.

Lighting Fixtures.

101. Each car is to be equipped with a four-light electrolier or ceiling light of approved design, complete with Edison sockets, and controlled by a double-pole flush-pattern rotating switch mounted in car.

102. Fixtures to be connected to the electric wiring systems of the buildings from junction boxes in elevator shafts with rubber-insulated flexible conductors having heavy outer braided covering and rope center.

Annunciators.

103. Each car must be provided with an electric annunciator system, complete in every detail, designed to receive calls by means of push buttons from each floor at any point of elevator travel.

104. Annunciators must be of first-class and approved type, mounted in a metal case of a design and finish approved by the mechanical engineers.

105. Wire cables for car connections to be best quality No. 18 B. W. G. cotton-covered wire, covered with extra-heavy double outer braid and secured in proper manner to cars and at junction boxes located in shafts. All wiring from push buttons to junction boxes and to batteries to be rubber-insulated and braided wire, run in iron conduit provided with necessary outlet boxes, supports, etc.

106. A complete open-circuit battery outfit is to be provided in each elevator shaft.

107. Push buttons, batteries, wiring, etc., are to be approved by the mechanical engineers and located and installed as directed.

Indicators.

108. A mechanically operated car indicator of metal construction to match in material and finish the grille work at entrances to shafts is to be provided, one for each car, and properly installed to indicate the position of cars in shafts.

109. Indicators and operating mechanism of same must be approved by the mechanical engineers, and bidders are required to state in the proposal the amount included in total bid for each indicator complete.

HOIST-WAY APPLIANCES, ETC.

Counterweights.

110. Each elevator must be equipped with double counterweights, one attached to car and one to drum, each carried in a separate frame.

111. The drum counterweight plus the car counterweight to be such as will balance the car and its average load.

112. Weight frames of steel to be so constructed that the weights can not be jarred out or released by the spreading of the rods connecting top and bottom of counterweight frames.

Cables.

113. All cables are to be best Swedish iron standard hoisting rope, $\frac{5}{8}$ inch diameter, made with six strands and nineteen wires per strand, the strands to be wound about a hemp core or center.

114. Two lifting cables, two cables for drum counterweights, and two for car counterweights, six cables in all, are to be provided. Cables to be connected to car and counterweight frames in an approved manner.

115. Hoisting and drum counterweight cables to be of such lengths that there will always be at least one complete turn of each on drum at any position of car.

Guides.

116. Guides for all elevators are to be of best quality cold-rolled steel of tee-bar section, $4\frac{1}{2}$ by $3\frac{1}{2}$ inches, weighing not less than 15.8 pounds per linear foot, which are to be securely fastened at least every 6 feet by two $\frac{5}{8}$ -inch tap bolts to 7-inch 17.25-pound channel irons, except at center of double elevator shafts, where the tee bars are to be secured as specified to two 6-inch-15.5-pound channels, bolted back to back and secured at top and bottom to the **I** beams in place with standard connections.

117. Joints in guides must be milled square, tongued and grooved, forming matched joints, which must not come within 3 feet of the joints in the channel irons.

118. The channel irons for guide supports are to be installed under this contract. At shaft walls the channel irons are to be bolted to 3 by 3 by $\frac{3}{8}$ inch angle irons secured in place to walls with $\frac{5}{8}$ -inch expansion bolts placed not over 6 feet apart, an angle being placed on each side of the channel from top to bottom of shaft.

119. Six-inch channel bars are to be bolted to top of partition walls at approximately basement-floor line in double elevator shafts, for supporting channels for guides at those points.

120. Heavy base plates mounted on concrete footings are to be provided for the support of the guides. The concrete piers are to be constructed under this contract, of approximate dimensions given by details.

121. Guides for the counterweight frames are to be arranged inside of shafts as indicated, to be heavy planed tee iron, matched or doweled together, and secured with fish plates on backs. The guides are to be fastened in a substantial and approved manner.

Spring Buffers.

122. Heavy buffer springs are to be mounted on the concrete piers at bottom of each shaft to prevent car platform, or mechanism mounted under same, from striking bottom of shaft if car travel is exceeded.

Machine Platforms.

123. At the top of each shaft there is to be placed under this contract a platform for supporting the elevator machines, constructed as shown by details on drawing No. E. 152. The platforms at the double shafts are to be supported on three 12-inch **I** beams and at the single shafts on three 10-inch **I** beams built into the shaft walls.

124. The platforms are to consist of 3 by 10 inch finished tongued and grooved stock, securely fastened in place to 2 by 6 inch strips bolted to the upper flanges of the **I** beams and secured in place with expansion bolts where same are placed over attic-floor construction. The platform is to be covered with 20-ounce sheet copper, securely fastened to platform and extending over edges of same.

125. Where openings are provided in platforms for cables, metal sleeves of No. 20 B. W. G. iron are to be installed, extending about $1\frac{1}{2}$ inches above the floor of platforms, and the copper is to be soldered to these sleeves. The metal sleeves are to be provided with flanges, which are to be securely fastened to bottom of platform.

126. The planking is to entirely close the shafts and the copper of platform is to be turned up on shaft walls about 1 inch.

127. All woodwork of platforms to be of selected best quality long-leaved pine finished all over.

Tools.

128. Two complete sets of wrenches for elevators are to be furnished and mounted in suitable hard-wood frames, to be located where directed by the mechanical engineers, one in each building.

Painting.

129. All ironwork installed under this contract, unless otherwise specified, including machines, guideposts, framing, etc., to receive two coats of metallic or antirust paint before being placed in position.

130. With the exception of the elevator machines, which are to be finished in approved dark coach color, all ironwork, including the 8-inch **I** beams in double elevator shafts, is to have finishing coats as directed, consisting of linseed oil and white lead paint.

PROPOSAL FOR ELECTRIC PASSENGER ELEVATORS OF TWO LABORATORY BUILDINGS FOR THE UNITED STATES DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

N. B.

131. After these proposal sheets have been filled out by the bidder they must be detached from specification and forwarded under separate cover, with postage prepaid by the sender.

132. The various amounts, names of appliances, materials, etc., on the proposal sheets are requested to be typewritten.

....., 190 .

To the SECRETARY OF AGRICULTURE,
Washington, D. C.

SIR:

133. hereby propose to furnish all the labor and materials and install complete Six Electric Passenger Elevators of Two Laboratory Buildings for the United States Department of Agriculture, in strict accordance with drawings Nos. E. 151 and E. 152,

and the specification, for the sum of

..... (\$.....)

134. Amount to be deducted from the total proposal if the two elevators, one in each building, designed as elevators Nos. A-1 and B-1, are omitted complete, including machines, cars, guides, etc., but not including the platforms and supporting beams in attic:

..... (\$.....)

135. Amount to be added to total proposal if the six elevators are equipped with the additional safety device (see paragraph 88 of the specification):

..... (\$.....)

(i)



II

136. Amount to be added to total proposal if four of the elevators are equipped with the additional safety device (see paragraph 88 of the specification) :

..... (\$.....)

137. Amount to be added to or deducted from the total proposal if the six elevators are equipped with the additional safety device above mentioned and the guide-grip safeties are omitted:

Add (\$.....)

Deduct (\$.....)

138. Amount to be added to or deducted from the total proposal if four of the elevators are equipped with the additional safety device above mentioned and the guide-grip safeties are omitted:

Add (\$.....)

Deduct (\$.....)

Name and manufacturer of additional safety device:

139. Amount included in total bid for each car indicator complete, including operating mechanism:

..... (\$.....)

Motor Data.

140. Rated horsepower of each motor:

Guaranteed efficiency of each motor at—

$\frac{1}{4}$ load, ; $\frac{1}{2}$ load,

$\frac{3}{4}$ load, ; full load,

III

141. Trade name and name and address of manufacturer of electric motors:

.....

.....

142. Trade name and name and address of manufacturer of controller:

.....

.....

(Signature)

(Address)

NAMES OF INDIVIDUAL MEMBERS OF FIRM.

.....

.....

Name of Corporation,

Name of President,

Name of Secretary,

Under what law corporation is organized,

